

REMARKS

This is in response to the Office Action dated February 7, 2005. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

Initially, the abstract has been revised in order to bring it into compliance with the guidelines set forth in MPEP 608.01(b). Note that the changes to the abstract are submitted in the form of a substitute abstract. A marked-up version of the abstract, with changes marked therein, is attached and entitled "Version with Markings to Show Changes Made."

On pages 2-3 of the Office Action, claims 1-6, 9-12, 14-16, and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Takamura (U.S. Patent No. 5,469,646). In response, independent claims 1, 2, 5, 6, 9, 10, and 11 have been amended to clearly distinguish over the applied reference.

The present invention is directed to an engine control device in which a target torque line is set so that the torque varies continuously with respect to rotational speed from a low rotational speed to a high rotational speed, the target torque line passing through a fuel consumption minimum point, where a fuel consumption rate becomes minimum or through a vicinity of the fuel consumption minimum point in the engine torque diagram, and the engine is controlled to match at a point on the target torque line, i.e., the torque and speed of the engine are controlled on the target torque line in the engine torque diagram.

With the claimed configuration, as described on page 5, lines 3 through 17 of the

specification, the engine 2 operates in an area where fuel consumption is low (good) so that the engine efficiency can be enhanced. Further, a correspondence G between a load LD applied to the engine 2 and a target rotational speed ND of the engine 2 is stored according to the continuous target torque line L1, and the engine 2 is controlled so as to be operated along the target torque line L1 by determining the target rotational speed ND corresponding to the load LD applied to the engine 2 from the stored correspondence G (see Figs. 3 and 4).

Takamura discloses a fine operation changeover device for a hydraulic excavator. In the Takamura control device two matching points, where fuel consumption is at a minimum, are determined on the torque curve, i.e., two points where the equivalent horsepower curves HP_S and HP_B contact the equivalent fuel consumption curve FC (see col. 1, line 65 to col. 2, line 15; and col. 9, line 60 to col. 10, line 2).

Further, as described in col. 8, line 55 through col. 9, line 59, the matching points are determined by, for example, controlling the governor unit with a control signal i_N that is in proportion to the difference ΔNB between the target engine rotation rate NB and the actual engine rotation rate N.

However, **Takamura** does not describe along what path the torque and speed of the engine move from the no load state to the two points where the equivalent horsepower curves HP_S and HP_B come into contact with the equivalent fuel consumption curve FC in Fig. 6.

According to the present invention as shown, for example, in Fig. 4, since the

target torque line is set so that the torque varies continuously with respect to the rotational speed from a low rotational speed to a high rotational speed, the target torque line passing through a fuel consumption minimum point, where a fuel consumption rate becomes minimum or through a vicinity of the fuel consumption minimum point in the engine torque diagram, and the engine is controlled to match at a point on the target torque line; matching can be effected approximately along the target torque line from the no load state to the rated point. As a result, an engine can be controlled so as to achieve an improved fuel consumption rate.


Accordingly, it is submitted that the Takamura reference does not disclose or suggest an engine control device in which a target torque line is set to pass through a fuel consumption minimum point and to be continuous from a low rotational speed to a high rotation speed on the engine torque diagram, and the engine is controlled to match at a point on the target torque line. Thus, the Takamura reference does not anticipate claims 1-6, 9-12, 14-16 and 23-24 under 35 U.S.C. 102(b).

In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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